



Figure 1 in file

COPY

JDP-3 DNA polymerase nucleotide sequence: 2331 nucleotides (SEQ ID NO: 1)

ATGATCCTGACGTTGATTACATCACCGAGAATGGAAAGCCGTATCAGGGTCTTCAGGAAGGAGAACGG  
CGAGTCAGGATTGAATACGACCGCAGTCAGGCCTACTTCTACCGCCTCAGGGACGACTCTGCCA  
TCGAAGAAAATCAAAAGATAACCGCGGAGAGGCACGGCAGGGCGTTAAGGTTAAGCGCGGAGAACGGTG  
AAGAAAAAGTTCTCGGCAGGTCTGTGGAGGTCTGGTCCTCTACTTCACGCACCCGAGGACGTTCCGGC  
AATCCCGACAAAATAAGGAAGCACCCCGGGTACATGACATCTACGAGTACGACATACCCCTCGCCAAGC  
GCTACCTCATAGACAAGGGCTAATCCCGATGGAAGGTGAGGAAGAGCTTAAACTCATGTCCTTCGACATC  
GAGACGCTCTACCACGAGGGAGAAGAGTTGGAACCGGGCGATTCTGATGATAAGCTACGCCGATGAAAG  
CGAGGCGCGTGTGATAACCTGGAAGAAGATCGACCTCCTACGTTGAGGTGTCTCCACCGAGAACGGAGA  
TGATTAAGCGCTCTTGAGGGCGTTAAGGAGAACGGACCCGGACGTGCTGATAACATACACGGCGACAAAC  
TTCGACTTCGCTTACCTGAAAAGCGCTGTGAGAAGCTTGGCGTGAGCTTACCCCTCGGGAGGGACGGGAG  
CGAGCGAAGATAACAGCGCATGGGGACAGGTTGCGGTGAGGTGAAGGGCAGGGTACACTTCGACCTTT  
ATCCAGTCATAAGGCGCACCATAAACCTCCCACCTACACCCCTGAGGCTGTATACGAGGCGGTTTCGGC  
AAGCCCAAGGAGAACGGTCTACGCCGAGGAGATAGCCACCGCTGGAGACCGGGAGGGGCTTGAGAGGGT  
CGCGCCTACTCGATGGAGGACGCGAGGGTACCTACGAGCTTGGCAGGGAGTTCTCCGATGGAGGCC  
AGCTTCCAGGCTCATCGGCCAAGGCTCTGGACGTTCCGCTCCAGCACCGAACCTCGTCGAGTGG  
TTCCTCTAAGGAAGGCCTACGAGAGGAACGAACCTCGCTCCAACAGCCGACGAGAGGGAGCTGGCGAG  
GAGAAGGGGGGCTACgcCGGTGGCTACGTCAAGGAGCCGGAGCGGGACTGTGGGACAATATCGTGTATC  
TAGACTTCTCGTAGCTCTACCCCTCAATCATAATCACCCACAACGCTCGCCAGATAACGCTCAACCGCGAG  
GGGTGTAGGAGCTACGACGTTGCCCCGAGGTGCGTCACAAGATTCTCGCCAACAGCTACTACGGCTACTAC  
GAGCCTGCTCGGAAACCTGCTGGAGGAAAGGAGAAGATAAGAGGAAGATGAAGGCAACTCTCGACCCGC  
TGGAGAAGAATCTCCTCGATTACAGGCAACGCCATCAAGATTCTCGCCAACAGCTACTACGGCTACTAC  
GGCTATGCCAGGGCAAGATGGTACTGCAAGGAGTGCACGGCTTACGGCATGGGAAGGGAGTACAT  
CGAAATGGTCATCAGAGAGCTTGAGGAAAAGTTGGTTAAAGTCTCTATGCAGACACAGCGTCTCC  
ATGCCACCATCCTGGAGCGGACGCTGAAACAGTCAGAAGAAAAGGCAATGGAGTTCTAAACTATATCAA  
CCCAAACGTCCCCGCTCTCGAACCTCGAATACGAGGGCTTCTACGTCAAGGGCTTCTCGTCACGAAGAA  
AAAGTACGCGGTATCGACGAGGAGGGCAAGATAACACCGCGGGCTTGAGATAGTCAGGCGCAGTGG  
GCGAGATAGCGAAGGAGACCGCAGGCAGGGTTGGAGGGAGATACTCAGGCACGGTGACGTTGAAGAGGCC  
GTCAGAATTGTCAGGGAAAGTCACCGAAAAGCTGAGCAAGTACGAGGTTCCGCCGGAGAACGCTGGTTATCCA  
CGAGCAGATAACGCGCGAGCTCAAGGACTACAAGGCCACCGGCCGACGTAGCCATAGCGAAGcGTTGG  
CCGCCAGAGGTGTTAAATCCGGCCCGGAACGTGATAAGCTACATCGTCTGAAGGGCTCCGGAAGGATA  
GGCGACAGGGCGATTCCCTCGACGAGTTGACGCCGACGAAGCACAAGTACGATGCCGACTACTACATCGA  
GAACCAGGTTCTGCCGGCAGTTGAGAGAAATCCTCAGGGCTTCCGCTACCGCAAGGAAGACCTCGCCTACC  
AGAAGACGAGGCAGGTGGCTTGGCGTGGCTGAAGCCGAAGGGAGAACAGTGA

FIG. 2.

JDF-3 DNA polymerase amino acid sequence (SEQ ID NO: 2)

Theoretical molecular weight: 90.3 kD

MILDVVDYITENGKPVIRVFKKENGEFRIEYDREFEPFYALLRDDS AIEEIKKITAERHGRVVKVKA EKV  
KKKFLGRSVEVWLVLYFTHPQDVP AIRDKIRKHPAVIDIYDIPFAKRYLIDKGLIPMEGEEELKLMSFDI  
ETLYHEGEEFGTGPILMISYADESEARVITWKKIDLPYVEV VSTEKEMIKRFLRVVKEKD P DVLITYNGDN  
FDFAYLKKRCEKLGVSF TLGRDGSEPKIQRMGDRFAVEVKGRVHF DLYPVI RRTINLPTY TLEAVYEA VFG  
KPKEKVYAAE IATAWETGEGLERVARYSMEDARV TYELGREFFPMEAQLSRLIGQGLWDVSRSS TGNLVEW  
FLLRKAYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSL YPSIIITHNVSPDTLNRE  
GCRSYDV APEVGHKFCKDFPGFIPSILLGNLLEERQKIKRKMKA TLDPLEKNLLDYRQRAIKILANSYYGYY  
GYARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYADTDGLHATIPGADAETVKKKAMEFLNYIN  
PKLPG LLELEYEGFYVRGFFVTKKYAVIDEEGKITTRGLEIVRRDWSEIAKETQARVLEAILRHGDVEEA  
VRIVREVTEKLSKYEV PPEKLV IHEQITRELKDYKATGPHVAIAKRLAARGV KIRPGTV ISYIVLKGS GRI  
GDRAIPFDEFDPTKH KYDADYYIENQVLP AVERILRAFGYRKEDLRYQKTRQVGLGAWLKPKG KKK

FIG. 3.  
JDF-3 DNA polymerase with intein sequence (SEQ ID NO: 3)

MILDVVDYITENGKPVIRVKKKENGEFRIEYDREFEPFYALLRDDS AIEE  
IKKITAERHGRVVVKVRAEKVKKKFLGRSVEWWVLYFTHPQDVPAIRDKI  
RKHPAVIDIYEYDIPFAKRYLIDKGLIPMEGEEELKLMSPDIETLYHEGE  
EFGTGPILMISYADESEARVITWKKIDLPYVEVVSSTEKEMIKRFLRVVKE  
KDPDVLLITYNGDNFDFAVLKKRCEKLGVSFTLGRDGSEPKIQRMGDRFAV  
EVKGRVHF DLYP VIRRTINLPTY TLEAVYEA VFGKPKEKVYAE EIA TAW E  
TGEGLERVAR YSMS EDARV TYELGREFFPMEAQLSRLIGQGLWDVRSSTG  
NLVEWFLLRKAYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNI  
VYLDFRSLYPSIIITHNVSPDTLNREGCRSYDVAP EVGHKFCKDFPGFIP  
SLLGNLLEERQKIKRKMATLDPLEKNLLDYRQRAIKILAN

Extein 1

SLLPGEWVA  
VIEGGKLRPVRIGELVDGLMEASGERVKRDGTTEVLEVEGLYASPSTGSP  
RKPAQCR\*KP\*\*GTAMP GKFT\* LSTPEGGLSVTRGHSLFAYRDASLWR\*  
RGRRRFKPGDLLAVPSG\*PSRRGGRGSTSILNCSSNCPRRKPTCHRHS GK  
GRKNFFRGMILRTLWIFGEEKTGGRPGATWSTLRLGLGVKLKIGYGVVD  
REGLGKVPRFYERLVEVIRYNGNRGEFIADFNALRPVLRLLMMPEKELEEW  
LVGTRNGFRIRPFIEVDWKFAKLLGYYVSEGSAGKWKNRTGGWSYSVRLY  
NEDGSVLDMDMERLARSSLGA\*ARGELRRDFKEDGLHNLRGALRFTGREQE  
GSVAYLHVP\*GGPLGLP\*GVLHRRRRSPEQDGSAHQERASG\*RPRPAP  
ELAGR LSDKRPPRQRLQGLRERGTALYRVPEAEERLTYSHVIPREVLEE  
TSAGPSRRT\*VTGNSGSWWKAGSSTRKGPGVG\*AGSSTGI\*SSTGSRKSGR  
KATRGTTT\*ALRRRTSGGLWVPLRAQX

Intein 1

SYYGGYYARARWYC RECAES  
VTAWGREYIEMVIRELEEKFGFKVLYADTDGLHATIPGADAETVKKKAME  
FLNYINPKLPGLLELEYEGFYVRGFFVTKKYAVIDEEGKITTRGLEIVR  
RDWSEIAKETQARVLEAILRHGDVEEAVRIVREVTEKLSKYEVPP EKLVI  
HEQITRELKDYKATGPHVAIAKRLAARGVKIRPGTVISYIVLKGS GRIGD  
RAIPFDEFDPKHKYDADYYIENQVLP AVERILRAFGYRKEDLRYQKTRQ  
VGLGAWLKP KGGKKK

Extein 2

FIG. 4.  
JDF-3 DNA polymerase genomic sequence (SEQ ID NO: 4)

AATTCCACTGCCGTTTAACCTTCAACCGTTGAACCTGAGGGTGATT  
 TCTGAGCCTCCTCAATCACTTAATCGAGACCGCGATTACCTTGAACCTGG  
 TACACGTTCAACGATTGGTCTTGTAAAGTCGATACTGGCCGTGCTG  
 GATTTCTAAACGTCTCAAGAACGGCTTCATCAACGGAAACTGCCACGT 5' untranslated sequence  
 CTCCGCCGTCGTGAGGGTAAACCTGAAGTTCAAGACTTTGCAACGGAAT  
 GGCAGAGAACGGCAGTACCCCAGTGAAGAGCTTGAAAGCCAAGC  
 CGAGCTTCAGCGAATGTGCCGTGCCCTTGTCAAGAGTTGTGAGGCCCTG  
 ATTGTTGTTTCTCCTCTTGTATAACATCGATGGCGAAGTTATTAG  
 TTCTCAGTCGATAATCAGGCAGGTGTTGGTC

ATGATCCTTGACGTTGAT  
 TACATCACCGAGAATGAAAGCCGTCATCAGGTCTCAAGAACGGAGAA  
 CGGCGAGTTCAAGGATTGAATACGACCGCGAGTTGAGGCCCTACTTCTACG  
 CGCTCCTCAGGGACGACTCTGCCATCGAAGAAATCAAAAGATAACCCCG  
 GAGAGGCACGGCAGGGCGTTAAGGTTAAGCGCGGAGAACGGTGAAGAA  
 AAAGTTCTCGCAGGTCTGTGGAGGTCTGGTCTACTTCACGCACC  
 CGCAGGACGTTCCGGCAATCCGCGACAAAATAAGGAAGCACCCCGGGTC  
 ATCGACATCTACGAGTACGACATACCCCTCGCCAAGCGCTACCTCATAGA  
 CAAGGGCTAATCCGATGGAAGGTGAGGAAGAGCTTAAACTCATGTCCT  
 TCGACATCGAGACGCTTACACCGAGGGAGAACGGTTGGAACCGGGCCG  
 ATTCTGATGATAAGCTACGCCGATGAAAGCGAGGCGCGCGTGTAAACCTG  
 GAAGAAGATCGACCTTCTTACGTTGAGGTGTCCTCACCGAGAACGGAGA  
 TGATTAAGCGCTTCTTGAGGGCGTTAAGGAGAACGGACCGGACGTGCTG  
 ATAACATACAACGGCGACAACCTCGACTTCGCTACCTGAAAAAGCGCTG  
 TGAGAACGCTTGGCGTGAGCTTACCCCTGGGAGGGACGGGAGCGAGCCGA Extein 1  
 AGATACAGCGATGGGGACAGGTTGCGGTGAGGTGAAGGGCAGGGTA  
 CACTTCGACCTTATCCAGTCATAAGCGCACCATAAAACCTCCCGACCTA  
 CACCCCTTGAGGCTGTATACGAGGCGGTTTCGGAAGCCCAAGGAGAACGG  
 TCTACGCCGAGGAGATAGCCACCGCTGGAGACCCGGCGAGGGGCTTGAG  
 AGGGTCGCGCGTACTCGATGGAGGACGCGAGGGTTACCTACGAGCTTGG  
 CAGGGAGTTCTCCGATGGAGGCCAGTTCCAGGCTCATGGCCAAG  
 GCCTCTGGGACGTTCCCGCTCCAGCACCGCAACCTCGTCGAGTGGTTC  
 CTCCTAAGGAAGGCCAACGAGAGAACGAACTCGCTCCAACAGCCGA  
 CGAGAGGGAGCTGGCGAGGAGAACGGGGGCTACGCCGGTGGCTACGTCA  
 AGGAGCCGGAGCGGGGACTGTGGGACAATATCGTGTATCTAGACTTCGT  
 AGTCTCTACCCCTCAATCATATAATCACCCACACGCTCGCCAGATACTG  
 CAACCCGAGGGGTGTAGGAGCTACGACGTTGCCCGAGGTGCGTCACA  
 AGTTCTGCAAGGACTCCCCGGCTTCATTCCGAGCCTGCTCGGAAACCTG  
 CTGGAGGAAAGGCAGAACGATAAGAGGAAGATGAAGGCAACTCTGACCC  
 GCTGGAGAAGAACATCCTCGATTACAGGCAACCGGCCATCAAGATTCTCG  
 CCAAC

AGCCTTCTCCGGGAGTGGGTTGCGGTCAATTGAAGGGGGAAA  
 CTCAGGCCGTCCGCATCGCGAGCTGGTTGATGGACTGATGGAAGCCAG  
 CGGGGAGAGGGTAAAAGAGACGGCGACACCGAGGTCTTGAAGTCGAGG  
 GGCTTACGCCCTCCTCGACAGGGAGTCAAGAAAGCCGCACAATGC  
 CGGTGAAAGCCGTGATAAGGCACCGCTATGCCGGGAAGTTACAGAATA  
 GCTCTCAACTCCGGAGGGAGGATTAAGCGTGACGCCGGCACAGCCTCT Intein 1  
 TCGCGTACCGGGACCGCGAGCTGTGGAGGTGACGGGGAGGGAGGGTTC  
 AAGCCCGCGACCTCCTGGCGGTGCCAAGCGGATAACCCTCCCGAGAGG

AGGGAGAGGCTAACATCGTGAACGTCTCGAACTGCCGAGGAGGA  
 AACGGCGACATGTCATCGACATTCCGGCAAGGGTAGAAAGAACTTCTTC  
 AGGGGAATGCTCAGAACCTCCGCTGGATTTGGGGAGGAGAACCGG Intein 1  
 AGGGCGGCCAGGCCTACCTGGAGCACCTGCGTGGCTCGCTACGTGA  
 AGCTGAGGAAAATCGGCTACGGGTGTTGATAAGGGAGGGACTGGGAAAG  
 GTACCGCGCTTCTACGAGAGGCTCGTGGAGGTAATCGCTACAACGGCAA  
 CAGGGGGAGTTCATCGCCATTCAACCGCTCCGCCCGCTCCGCC  
 TGATGATGCCGAGAAGGAGCTTGAAAGAGTGGCTCGTGGACGAGGAAC  
 GGGTCAGGATAAGGCCGTTCATAGAGGTTGATTGAAAGTCGAAAGCT  
 CCTCGGCTACTACGTGAGCGAGGGAGCGCCGGAAAGTGGAAAAACCGGA  
 CCGGGGCTGGAGCTACTCGGTGAGGCTTACAACGAGGACGGAGCGTT  
 CTCGACGACATGGAGAGACTCGCGAGGAGTTCTTGGGGCGTGAGCGCG  
 GGGGAACTACGTCGAGATTCAAAGAACAGATGGCCTACATAATCTCGAG  
 GGGCTCTCGGGTTCACCGGGCAGAGAACAAAGAGGTTCCGTTGCTTATCTT  
 CACGTCCTCTGAGGAGGTCCGCTGGGCCCTTGAGGGTACTTCATCG  
 GCGACGGCGACGTTCACCGGAGCAAGATGGTCCGCTCTCACCAAGAGC  
 GAGCTCTGGCTAACGGCCTCGTCCCTGCTGAACTCGCTGGCGTCTC  
 AGCGATAAACGTCGCCACGACAGCGGGTTACAGGGCTACGTGAACG  
 AGGAACACTGCCCTTACAGAGTACCGGAAGCGGAAGAACGCTCACTTACT  
 CCCACGTCATACCGAGGGAAAGTGCTGGAGGAGACTCGGCCGGCCTTCC  
 AGAAGAACATGAGTCACGGAAATTCAAGGGAGCTGGTGGAAAGCGGGGAG  
 CTCGACGCGGAAAGGCCGGTAGGATAGGCTGGCTCTGACGGGATAT  
 AGTCCTCGACAGGGTCTCGGAAGTCAGGAAGGAAAGCTACGAGGGTACG  
 TCTACGACCTGAGCGTTGAGGAGGACGAGAAACTCTGGCGGCTTGGGT  
 TCCTCTACGCGCACACNN

AGCTACTACGGCTACTACGGCTATGCCAGGG  
 CAAGATGGTACTGCAGGGAGTGCAGCGAGAGCGTTACGGCATGGGAAGG  
 GAGTACATCGAAATGGTCACTAGAGAGCTTGAGGAAAAGTCGGTTTAA  
 AGTCCTCTATGCAAGACACAGACGGCTCCATGCCACCATTCTGGAGCGG  
 ACGTGAACAGTCAGGAAAAGGCAATGGAGTTCTAAACTATATCAAT  
 CCCAAACTGCCGGCTCTCGAACTCGAATACGAGGGCTCTACGTCA  
 GGGCTCTCGTCACGAAGAAAAGTACGCGGTATCGACGGAGGGCA  
 AGATAACCACGCGCGGGCTTGAGATAAGTCAGGCGCAGTGGAGCGAGATA  
 GCAGGAGGAGACGCCAGGGTTTGGAGGCATACTCAGGCACGGTGA Extein 2  
 CGTTGAAGAGGCCGTCAGAATTGTCAGGGAAAGTCACCGAAAAGCTGAGCA  
 AGTACGAGGTTCCGCCGGAGAAGCTGGTTATCCACGAGCAGATAACGCGC  
 GAGCTCAAGGACTACAAGGCCACCGGGCCGACGTAGCCATAGCGAAGCG  
 TTTGGCCGCCAGAGGTGTTAAATCCGGCCCGAACGTGTGATAAGCTACA  
 TCGTCTGAAGGGCTCCGGAGGATAGGCGACAGGGCGATTCCTCGAC  
 GAGTCGACCCGACGAAGCACAAGTACGATGCGACTACTACATCGAGAA  
 CCAGGGTCTGCCGGAGTTGAGAGAATCCTCAGGGCTTGGCTACCGCA  
 AGGAAGACCTCGCCTACAGAGACGAGGCAGGTGGCTGGCTGGCGTGG  
 CTGAAGCCGAAGGGAAAGAAGAAGTGA

GGAATTATCTGGTTCTTTCCC  
 AGCATTAAATGCTTCCGACATTGCTTATTTATGAAACTCTGTTGCCCC  
 TGAGTTGTCAGAAAACAGCCTGTTCTGACGGCGTTTCTTGCAG  
 GTCTCTGAGTTGCAAGGGCTTCTCGACCAGCTCAATGGTCTTGTGCG  
 TCATTGTTNNNNNNNNNNNNNNNNNNNNNNCCGGGACTTCATACTGGC  
 GGTAATAGACAGGGATTCCCTCCTCAAGGACTTCCGGAGGCATTGGAG  
 TTTTTGGTGGGGCTTCACAGGATTGCTCATCTGTGGATTCTCGTT  
 CGATTGAATCTGTCCACTTGAGGGTGTAGGTCGAGACGGTGGAGCGCGTA

TTCCGGGAGCGGGTCTGAGGCTCATTTCAGTCCTCCGGCGAAG 3' Untranslated sequence  
AAGTGGAACTCAAGCCGGGTAGCTTATGTTATGTTCCAACCTCC  
AGCACCTCCAGGATCCCCTCAATCCCGAACCTCGAAGCCCCCTCTCGTGG  
ATCTTCTAACTCCTCTGCCTCCGGTTATCCAGACCAGCCCACATGCC  
GGCTCTCAGCGCACCCCTCGAAATCCTCCCGTAGGTGTCGCCGATGTGGA  
TTGCCTCGTCCGGCTCGACCCCGAACATCGAGCGGTTCTGAACATCT  
CGGGCATCGGCTTATACGCCAGAACCTCGTCGGCGAAGAAGGTTCCCTCA  
ATGTAGTCCATCAGGCCAACCTCTCGAGGGGGCCCGTACCCAAATT  
GCCCTATAGTGAGTCGATTACAATTCACTGGCCGTGTTACAACGTCG  
TGACTGGAAAACCCCTGGCGTTACCCAACTTAAGTCGCTTGAGCACAT  
CCCCC

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## Preliminary Qualification of Mutants

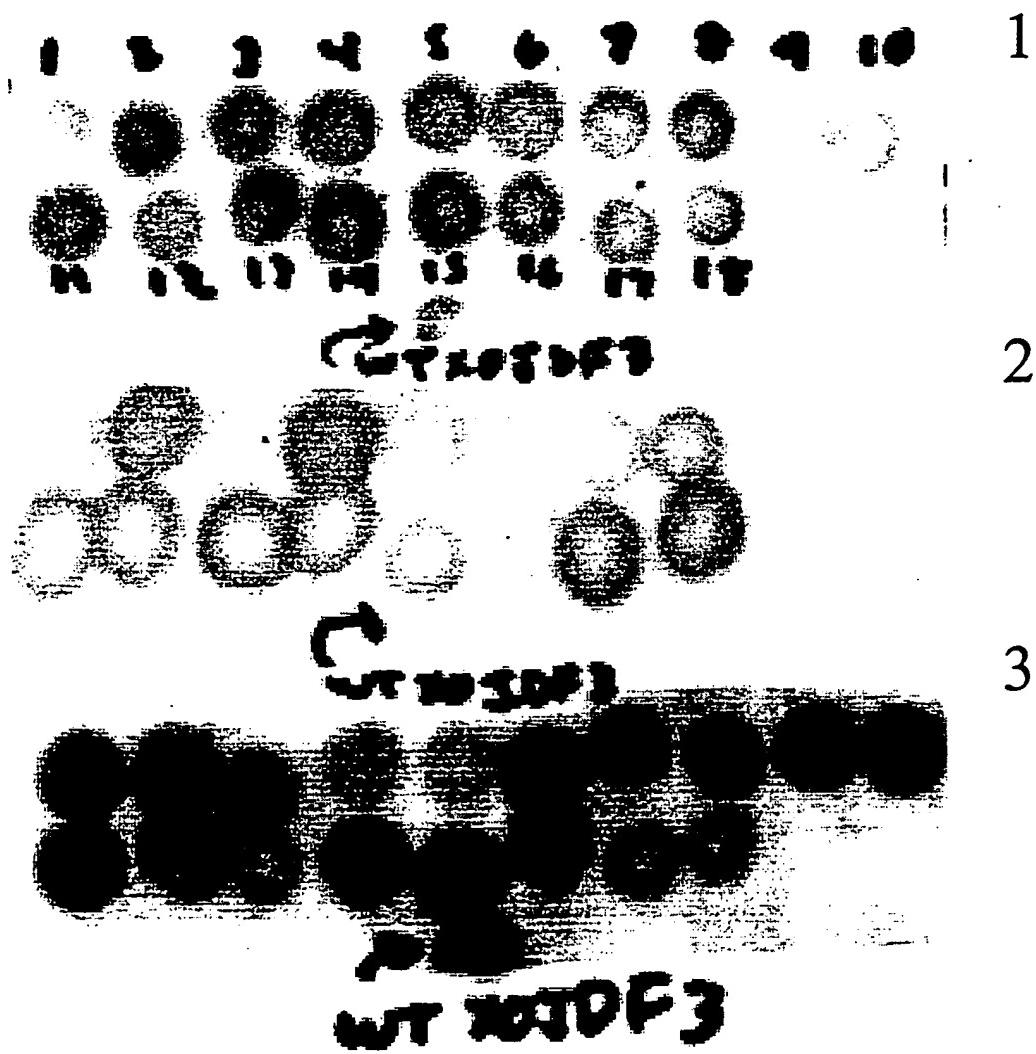


Figure 5

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## Sequencing with Purified Mutants

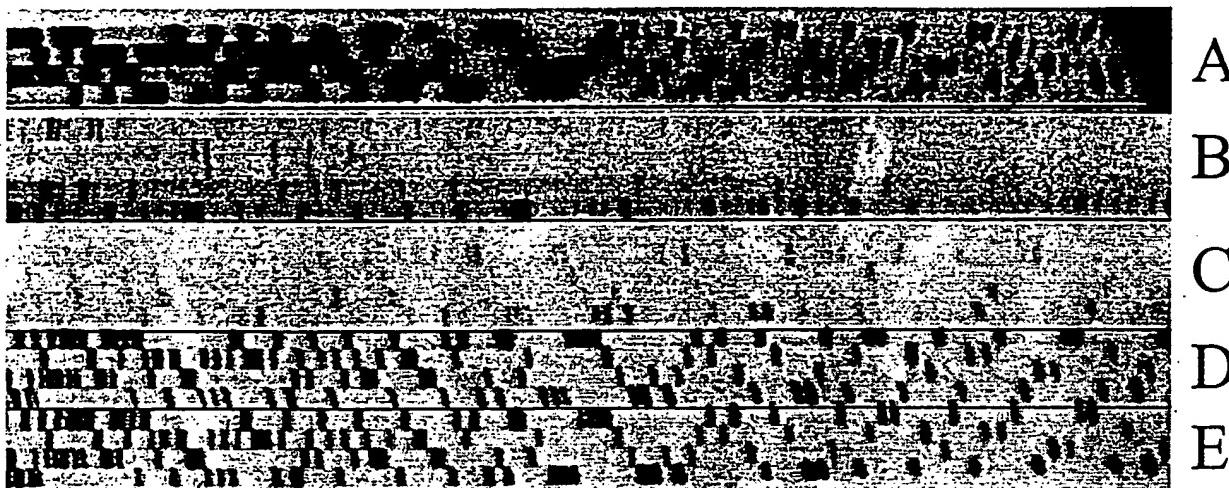


Figure 6

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# Sequencing with Dye-labeled Dideoxynucleotides

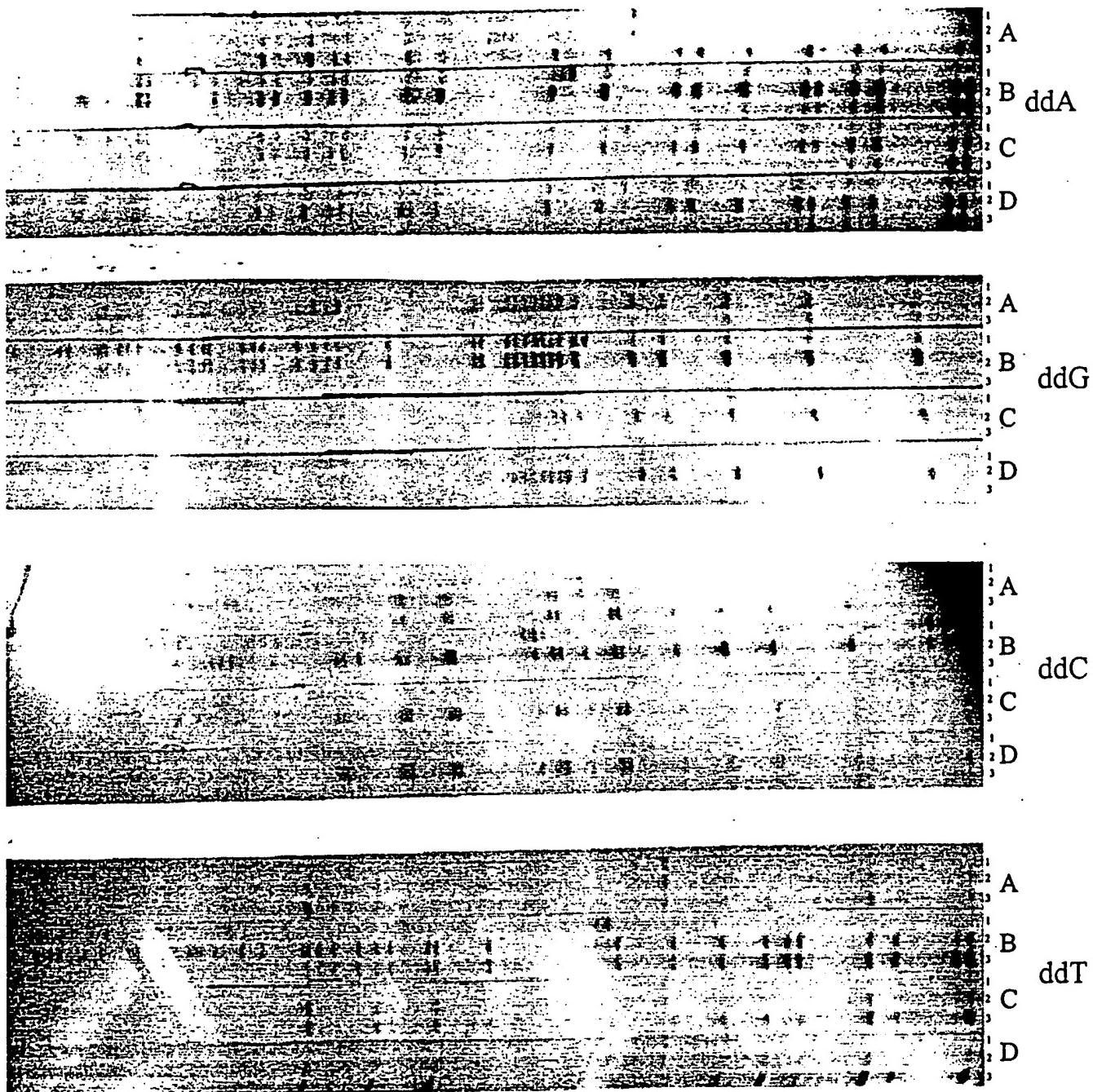


Figure 7

## Sequencing with the P410L, A485T Double Mutant and $\alpha$ -<sup>33</sup>P Dideoxynucleotides

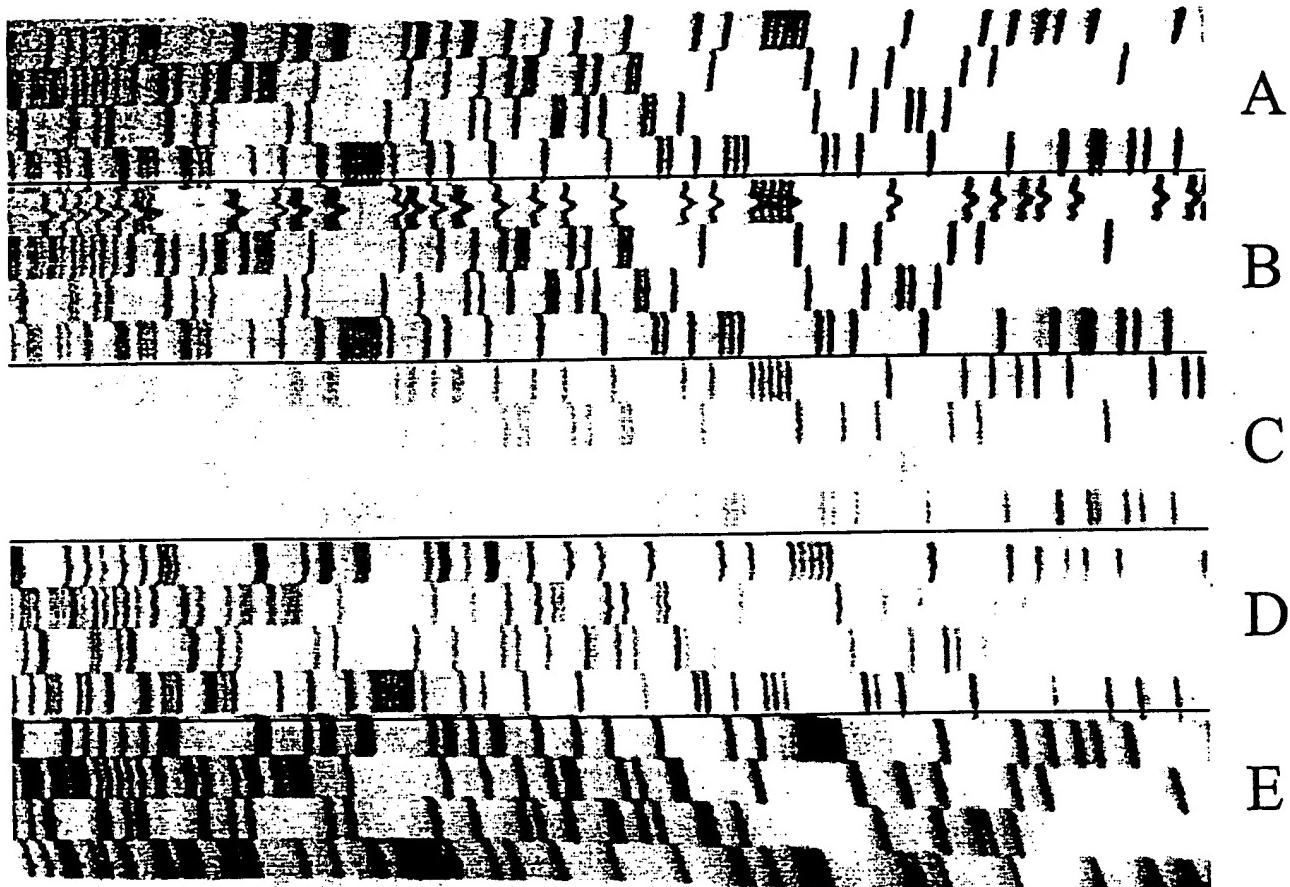
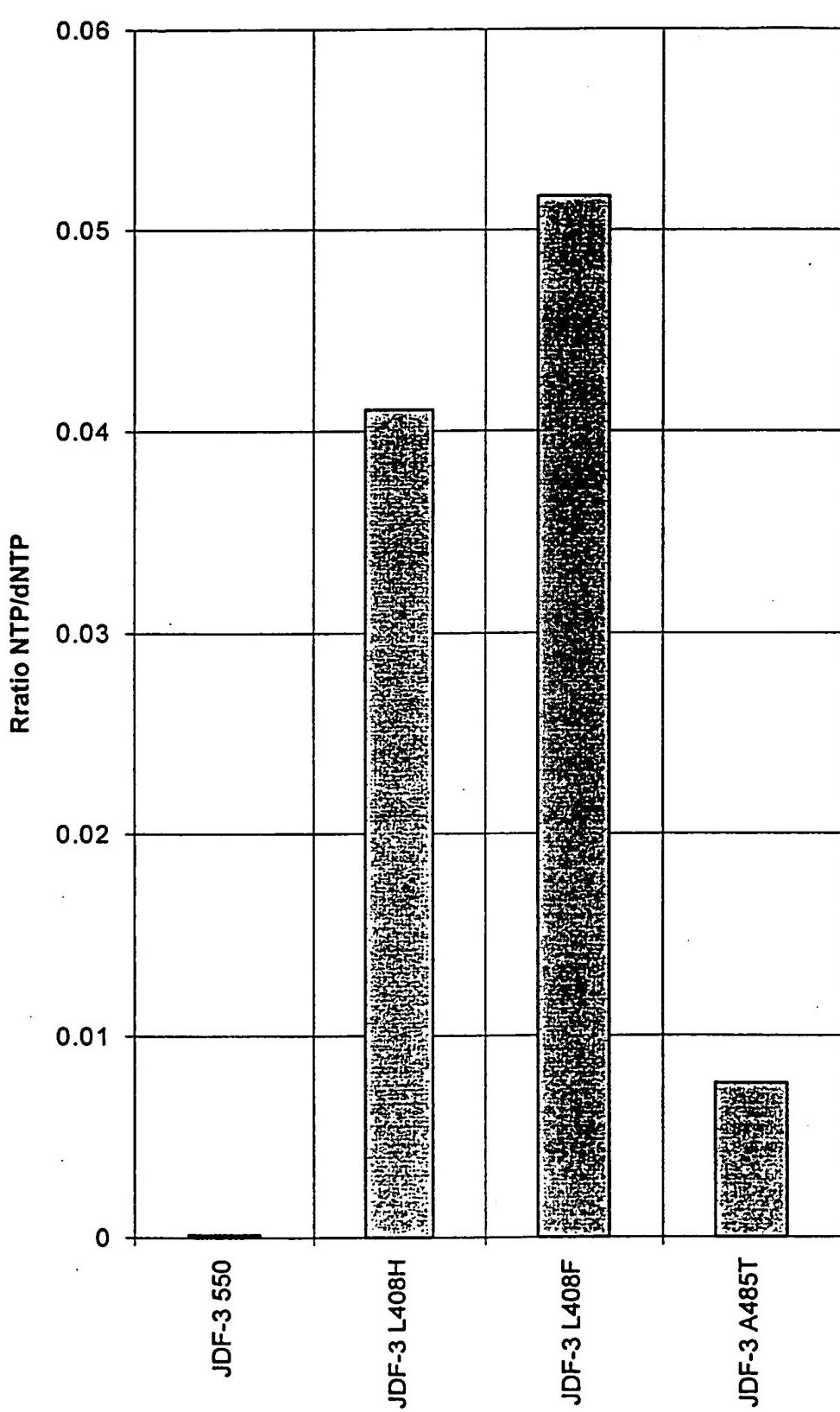


Figure 8

Figure 9



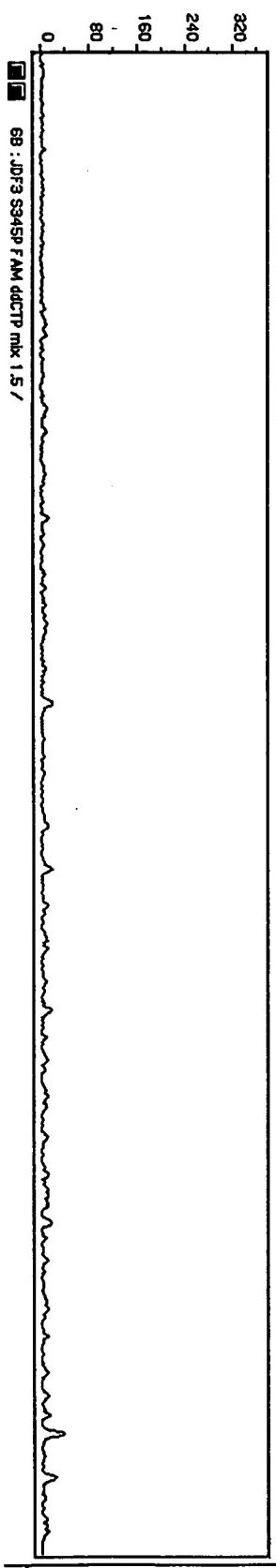
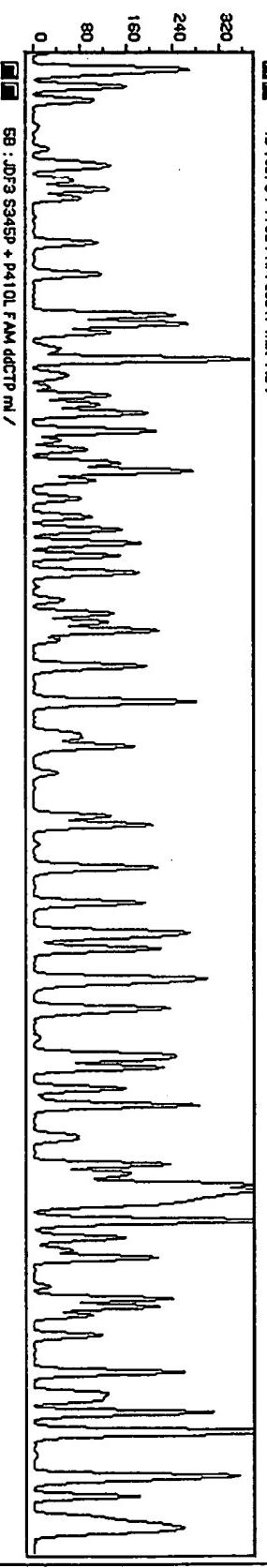
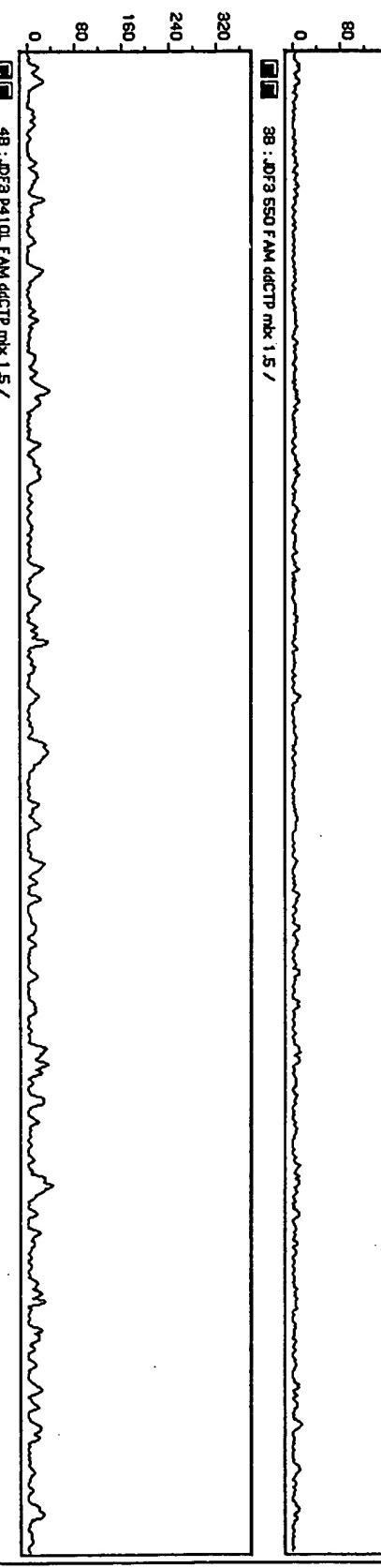
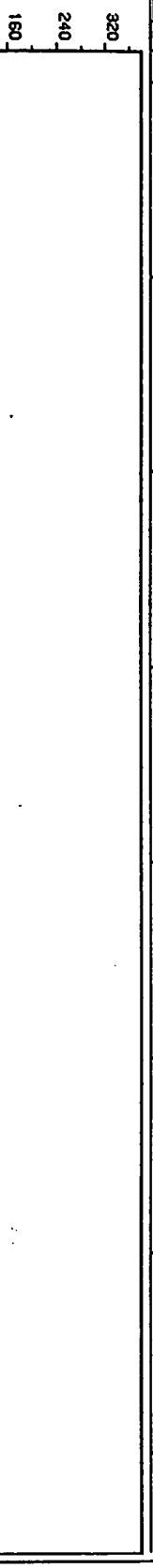


Figure 10

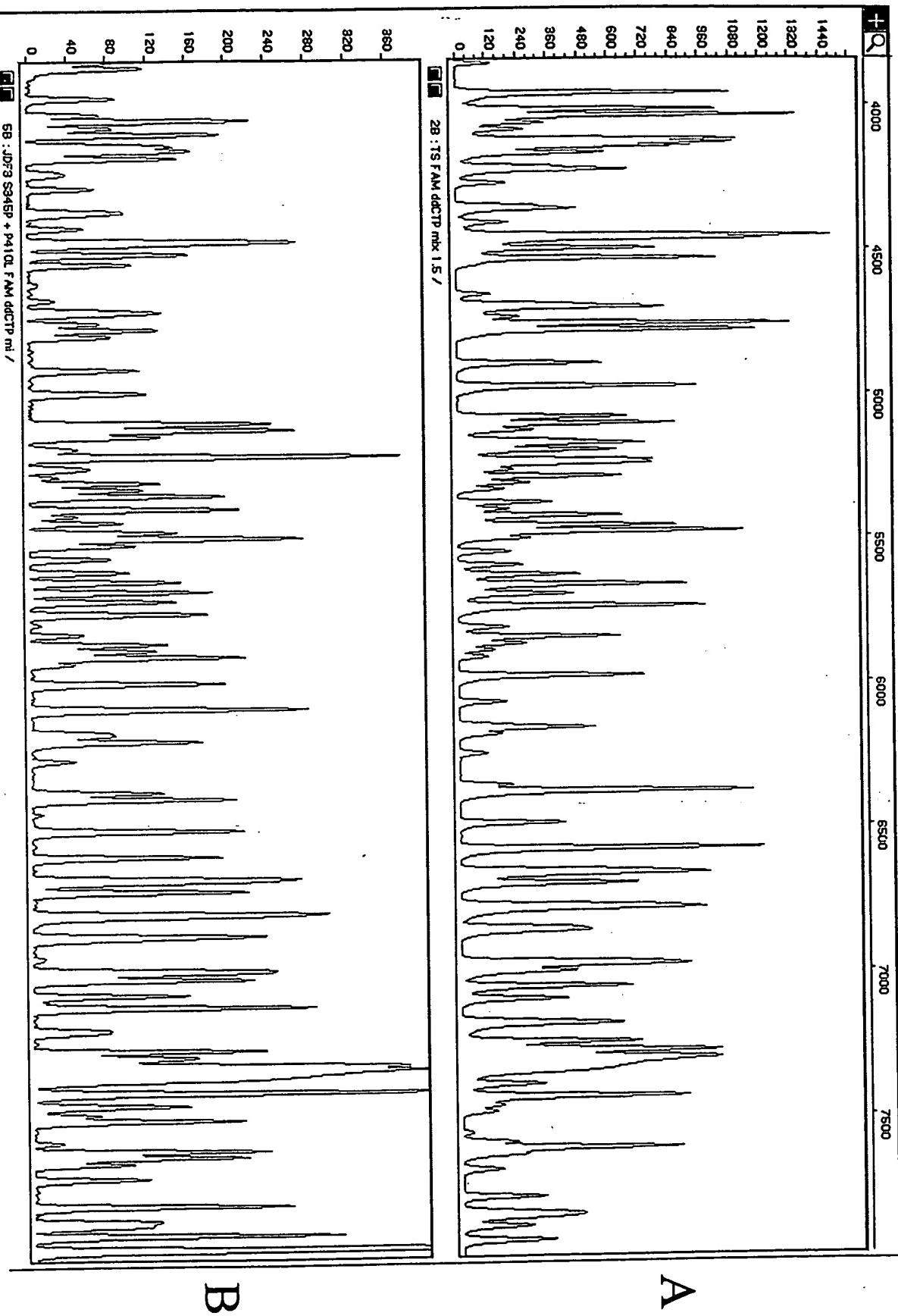


Figure 11

33P - TAAACGTTGGGGGGGGCA →  
TGCAACCCCCCGTAT

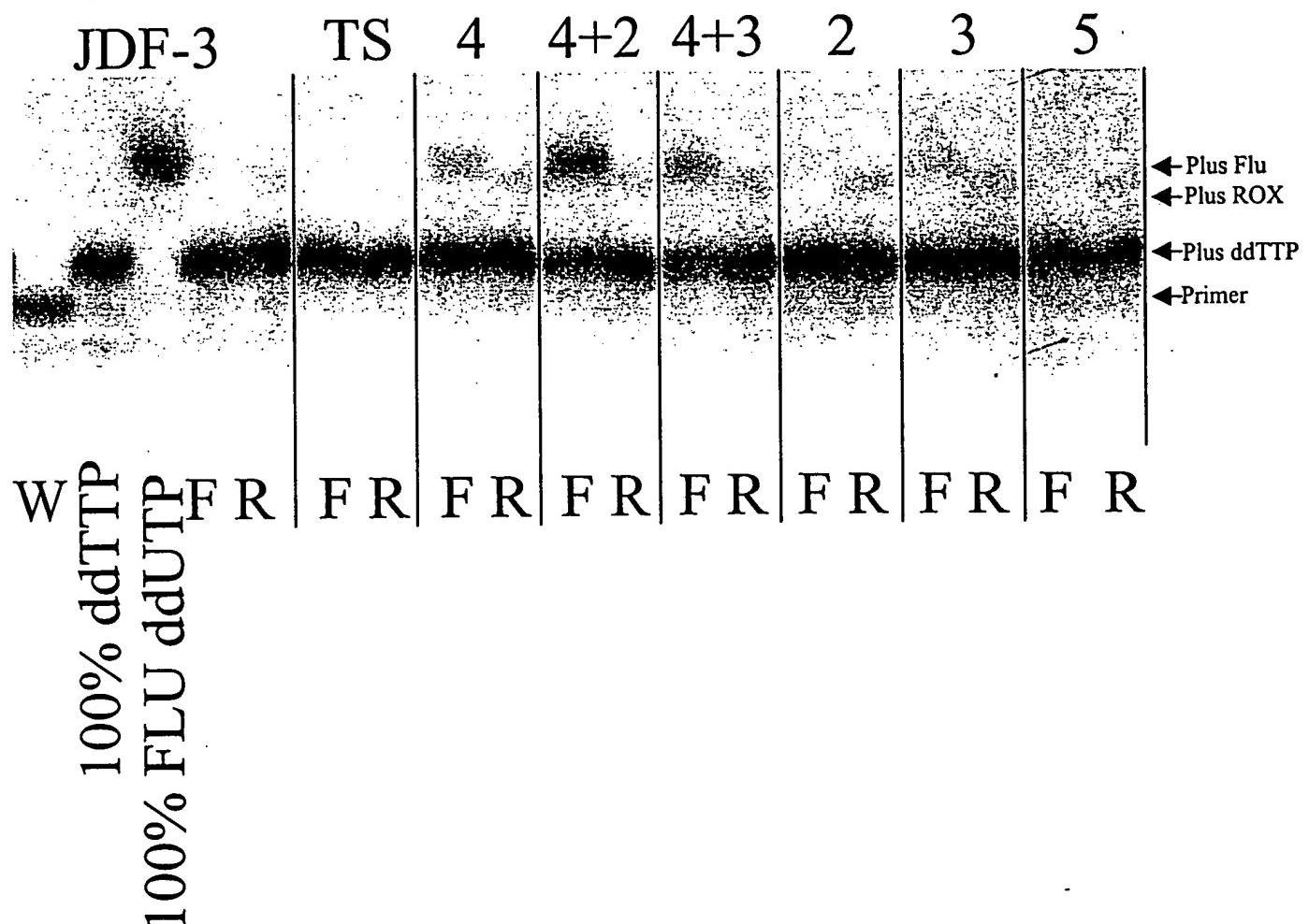


Figure 12

Flu ddUTP signal/ddTTP signal

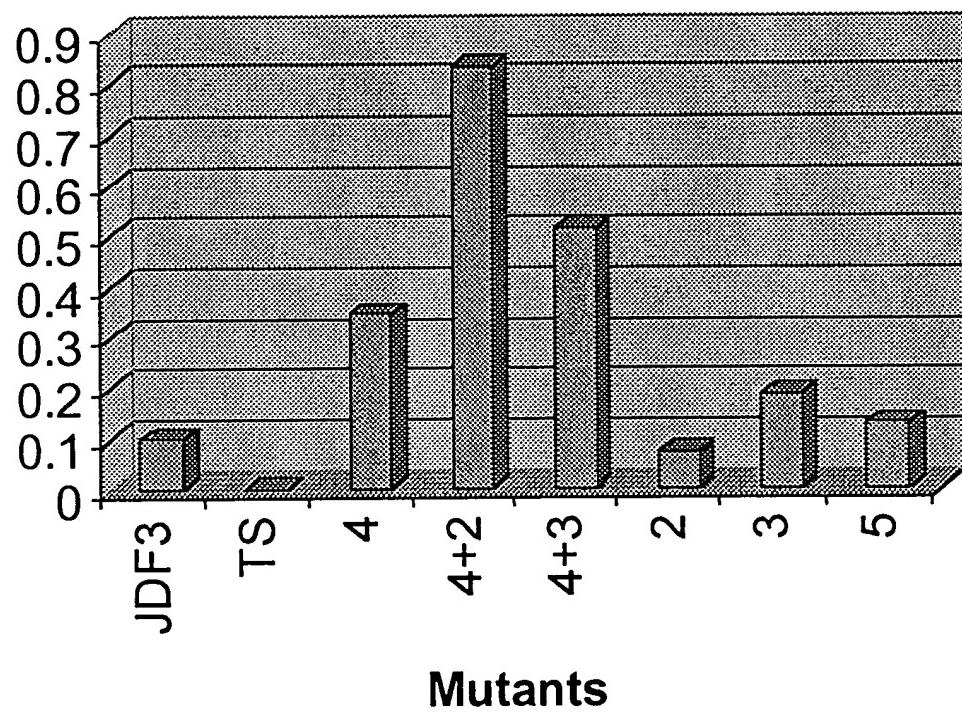


Figure 13

4	1	- - - - - LVXNAXSTGNLVEWFLLRK
10	1	- - - - - VWDVSRSSSTGNLVERFLLRK
13	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
16	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
18	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
19	1	- - - - - VWDVXRSSSTGNLVEWFLLRK
28	1	- - - - - VWDVPRSSSTGNLVEWFLLRK
34	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
41	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
33	1	- - - - - VWDVSRSSSTGNLVEWFLLRK
48	1	- - - - - YWSXPXLRTGNLVEWFLLRK
55	1	- - - - - VIGTXPRESSSTGNLVEWFLLRK
64	1	- - - - - XXXFWDVSRSSSTGNLVEWFLLRK
Jdf3	301	TGEGLERVARYSMEDARVTYELGREFFPMEAQLSRLIGQGIWVDSRSSTGNLVEWFLLRK

4	20	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
10	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHSVSP
13	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
16	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
18	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
19	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGOWDNIAYLDFRSLYPSIIITHNVSP
28	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
34	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
41	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGPWDNIVYLDFRSLYPSIIITHNVSP
33	21	AYERNKAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
48	21	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
55	22	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSHYPSIIITHNVSP
64	24	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP
Jdf3	361	AYERNELAPNKPDERELARRGGYAGGYVKEPERGLWDNIVYLDFRSLYPSIIITHNVSP

4	80	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
10	81	DTL <del>E</del> REGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
13	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
16	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
18	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
19	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
28	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
34	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
41	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
33	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
48	81	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGN <del>P</del> LEERQKIKRKMKA <del>TLDPLEKNLLD</del>
55	82	DTLNREGCRSYDVAPEDGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNHLD</del>
64	84	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>
Jdf3	421	DTLNREGCRSYDVAPEVGHKFCKDFPGFIPSLLGNLLEERQKIKRKMKA <del>TLDPLEKNLLD</del>

Figure 14

4	140	YRQRAIKILANSYYGYC <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
10	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
13	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
16	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
18	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
19	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
28	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
34	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
41	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
33	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
48	141	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
55	142	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
64	144	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD
Jdf3	481	YRQRAIKILANSYYGY <del>Y</del> YARARWYCRECAESVTAWGREYIEMVIRELEEKFGFKVLYAD

4	200	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
10	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
13	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
16	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
18	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
19	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
28	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
34	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
41	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
33	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
48	201	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
55	202	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
64	204	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE
Jdf3	541	TDGLHATIPGADAETVKKKAMEFLNYINPKLPG <del>L</del> LELEYEGFYVRGFFVTKKYAVIDEE

4	260	GKITTRGLEIVRRDWSEIAKETQARVLEAVL <del>R</del> HGDVEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
10	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHDVEEAVRIVREVTEKL <del>S</del> KYEVPPEEL
13	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
16	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
18	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
19	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
28	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
34	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
41	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
33	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
48	261	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
55	262	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEGA
64	264	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL
Jdf3	601	GKITTRGLEIVRRDWSEIAKETQARVLEA <del>I</del> LRHG <del>D</del> VEEAVRIVREVTEKL <del>S</del> KYEVPPEKL

Figure 15